Amendment to the Claims

In the Claims:

Please cancel Claims 41, 45, 47, 48, 52, and 53.

Also, please amend Claims 34, 35, 37, 39, 40, 42, 43, 45, 46 and 51, and add new Claim 54 and 55, as follows:

Claims 1-33 (Previously Canceled)

34. (Currently Amended) A method for detecting a feature using an imaging system, where the feature is part of an object and a probe can be attached to the feature, comprising the steps of:

(a) providing at least one ~~labeled~~ probe that selectively binds to said feature, wherein said at least one ~~labeled~~ probe comprises a binding element that selectively binds to at least a portion of said feature, and at least one optical signaling component;

(b) exposing said object to said at least one ~~labeled~~ probe under conditions that cause said at least one ~~labeled~~ probe to bind to at least a portion of said feature, if said feature is part of said object, such that a plurality of different optical signaling components become bound to said feature;

(c) collecting light from said object along a collection path, the light that is collected comprising light corresponding to each of the plurality of different optical signaling components that has been simultaneously collected;

(d) ~~focusing the collected light to produce an image corresponding to the object locations of labeled probes bound to said feature included in the image being optically discriminated but not spatially discriminated in the image~~ dispersing the light that is traveling along the collection path into a plurality of light beams, as a function of a plurality of different discriminable characteristics of the light;

(e) ~~detecting the image to produce a signal indicative of each optical signaling component bound to said feature; and~~ focusing each of the plurality of light beams to produce a respective image corresponding to that light beam, thereby simultaneously generating a plurality of images, locations of probes bound to said feature included in the plurality of images being optically discriminated;

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(f) ~~analyzing the signal to determine if a spectral component due to each optical signaling component bound to said feature is present in the image, thereby establishing that said feature is part of the object;~~ detecting the plurality of images to produce a signal indicative of each optical signaling component, such that a different signal is produced for each of the plurality of images; and

(g) analyzing each different signal produced for each of the plurality of images to determine if indicative spectral signals produced by the plurality of different optical signaling components are present, thereby establishing that the feature is part of the object.

35. (Currently Amended) The method of Claim 34, wherein the step of exposing said object to said at least one ~~labeled~~ probe comprises the step of exposing said object to a ~~labeled~~ probe that comprises said plurality of different optical signaling components, thereby binding said plurality of optical signaling components to said feature.

36. (Previously Canceled)

37. (Currently Amended) The method of Claim 34, wherein the step of analyzing ~~the signal~~ each different signal produced for each of the plurality of images comprises the step of determining if an intensity of a waveband of light indicative of said plurality of different optical signaling components is present in [[the]] that image.

38. (Previously Presented) The method of Claim 34, wherein said object comprises a biological cell, and said feature comprises a cellular component.

39. (Currently Amended) The method of Claim 34, wherein the step of analyzing ~~the signal~~ each different signal produced for each of the plurality of images comprises the step of determining if a multiplex of a spectral signature for each of the plurality of different optical signaling components is present in [[the]] that image.

40. (Currently Amended) The method of Claim 34, wherein the step of exposing said object to at least one ~~labeled~~ probe comprises the step of exposing said object to at least two ~~labeled~~ probes, each of which comprises a binding element that selectively binds to at least a portion of the feature, each of which comprises at least one optical signaling component, one of which includes a different optical signaling component, thereby binding the plurality of different optical signaling components to said feature.

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41. (Currently Cancelled)

42. (Currently Amended) A method for probing an object with ~~labeled~~ probes to detect if any of a plurality of specific features are part of the object, using an imaging system that does not spatially resolve locations of the ~~labeled~~ probes on any specific feature, wherein such ~~labeled~~ probes can be attached to each such feature, the method comprising the steps of:

(a) for each specific feature to be detected, providing at least one ~~labeled~~ probe that selectively couples to a corresponding specific feature, wherein each ~~labeled~~ probe comprises a binding element that selectively binds to at least a portion of the specific feature, and at least one optical signaling component that is bound to the specific feature by the binding element;

(b) exposing said object to said at least one ~~labeled~~ probe for each specific feature to be detected, under conditions that cause each labeled probe to couple to at least a portion of its corresponding specific feature, if that corresponding specific feature is part of said object, such that at least two different optical signaling components become bound to each specific feature that is part of said object, each of said at least two different optical signaling components that is bound to each specific feature being uniquely optically discriminable;

(c) ~~simultaneously detecting light from all optical signaling components bound to any specific feature that is part of said object, producing a corresponding signal; and~~ collecting light from said object along a collection path, the light that is collected comprising light corresponding to each of the plurality of different optical signaling components that has been simultaneously collected;

(d) ~~analyzing the signal to detect each optical signaling component bound to any specific feature that is part of the object, thereby determining which specific feature is part of the object~~ dispersing the light that is traveling along the collection path into a plurality of light beams, as a function of a plurality of different discriminable characteristics of the light;

(e) focusing each of the plurality of light beams to produce a respective image corresponding to that light beam, thereby simultaneously generating a plurality of images, locations of ~~labeled~~ probes bound to said feature included in the plurality of images being optically discriminated;

(f) detecting the plurality of images to produce a signal indicative of each optical signaling component, such that a different signal is produced for each of the plurality of images; and

(g) analyzing the signals produced for each of the plurality of images to determine which specific feature is part of the object.

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43. (Currently Amended) The method of Claim 42, wherein the step of exposing said object to said at least one ~~labeled~~ probe comprises the step of exposing said object to a ~~labeled~~ probe having a plurality of different optical signaling components, thereby binding the plurality of optical signaling components to said corresponding specific feature that is part of the object.

44. (Previously Presented) The method of Claim 42, wherein said object comprises a biological cell, and each feature comprises a cellular component.

45. (Currently Cancelled)

46. (Currently Amended) The method of Claim 43, wherein the step of exposing said object to ~~a labeled~~ said at least one probe comprises the step of exposing said object to at least two ~~labeled~~ probes selected to selectively bind to different portions of a first specific feature, each of said at least two ~~labeled~~ probes comprising:

(a) a binding element that selectively binds to at least a portion of the first specific feature; and

(b) at least one optical signaling component that is bound by the binding element to said at least a portion of the first specific feature, such that one of the at least two ~~labeled~~ probes comprises a different optical signaling component, so that a plurality of different optical signaling components are bound to the first specific feature.

47. (Currently Cancelled)

48. (Currently Cancelled)

49. (Previously Presented) The method of Claim 42, wherein each optical signaling component comprises a fluorescent dye, further comprising the step of directing sufficient energy toward said object, such that the fluorescent dye is excited to emit a fluorescent light comprising a uniquely discriminable characteristic of the optical signaling component.

50. (Previously Presented) The method of Claim 42, wherein an optical signature of said plurality of optical signaling components bound to each specific feature is uniquely discriminable based on an intensity of multiplexed light from the plurality of optical signaling components.

51. (Currently Amended) The method of Claim 42, wherein a spectral signature of the plurality of optical signaling components bound to a specific feature is uniquely discriminable based on a spectral composition of light from the plurality of optical signaling components.

52. (Currently Cancelled)

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53. (Currently Cancelled)

54. (New) A method for detecting a feature using an imaging system, where the feature is part of an object and a probe can be attached to the feature, comprising the steps of:

(a) providing at least one labeled probe that selectively binds to said feature, wherein said at least one labeled probe comprises a binding element that selectively binds to at least a portion of said feature, and at least one optical signaling component;

(b) exposing said object to said at least one labeled probe under conditions that cause said at least one labeled probe to bind to at least a portion of said feature, if said feature is part of said object, such that a plurality of different optical signaling components become bound to said feature;

(c) collecting light from said object along a collection path, while there is relative motion between the object and an apparatus employed to collect the light, the light that is collected comprising light corresponding to each of the plurality of different optical signaling components that has been simultaneously collected;

(d) focusing the collected light to produce an image corresponding to the object, locations of labeled probes bound to said feature included in the image being optically discriminated but not spatially discriminated in the image;

(e) detecting the image to produce a signal indicative of each optical signaling component bound to said feature; and

(f) analyzing the signal to determine if a spectral component due to each optical signaling component bound to said feature is present in the image, thereby establishing that said feature is part of the object.

55. (New) A method for probing an object with labeled probes to detect if any of a plurality of specific features are part of the object, using an imaging system that does not spatially resolve locations of the labeled probes on any specific feature, wherein such labeled probes can be attached to each such feature, the method comprising the steps of:

(a) for each specific feature to be detected, providing at least one corresponding labeled probe that selectively couples to the specific feature, wherein each labeled probe comprises a binding element that selectively binds to at least a portion of the specific feature, and at least one optical signaling component that is bound to the specific feature by the binding element;

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(b) exposing said object to said at least one labeled probe for each specific feature to be detected, under conditions that cause each labeled probe to couple to at least a portion of its specific feature to which it corresponds, if that specific feature is part of said object, such that at least two different optical signaling components become bound to each specific feature that is part of said object, each of said at least two different optical signaling components that is bound to each specific feature being uniquely optically discriminable;

(c) simultaneously detecting light from all optical signaling components bound to any specific feature that is part of said object while there is relative motion between the object and an apparatus employed to detect the light, producing a corresponding signal, such that the signal is produced without employing an interferometer to affect the light that is detected; and

(d) analyzing the signal to detect each optical signaling component bound to any specific feature that is part of the object, thereby determining which specific feature is part of the object.

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